

What is claimed is:

1. A fuel cell system comprising:
 - a fuel cell for generating power by being supplied with a fuel gas and an oxidizing gas;
 - a fuel gas supply path for supplying a fuel gas to the fuel cell;
 - a fuel off-gas circulation path for returning a fuel off-gas discharged from the fuel cell to the fuel gas supply path;
 - an ejector, provided in the fuel gas supply path and driven by fluid flow energy,
 - 10 for supplying the fuel off-gas in the fuel off-gas circulation path flow to the fuel gas supply path;
 - a fuel pump, provided in the fuel off-gas circulation path or on the fuel gas supply path and downstream with respect to the ejector, and driven by a rotating machine, for pressurizing the fuel off-gas;
 - 15 a discharge valve for discharging the fuel off-gas from the fuel off-gas circulation path; and
 - a control device operatively connected to the fuel pump and to the discharge valve.
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- 20 2. A fuel cell system according to claim 1, further comprising a voltage measuring device, connected to the control device, for measuring voltage of cells constituting the fuel cell,
 - wherein the control device is adapted to control the discharge valve so as to be opened and closed depending on the voltage of the cells measured by the voltage measuring device.

3. A fuel cell system according to claim 1, further comprising a state-of-load measuring device, connected to the control device, for measuring a state-of-load of the fuel pump,

wherein the control device is adapted to control the discharge valve so as to be
5 opened and closed depending on the state-of-load measured by the state-of-load
measuring device.

4. A fuel cell system according to claim 2, further comprising a state-of-load measuring device, connected to the control device, for measuring a state-of-load of the
10 fuel pump,

wherein the control device is adapted to control the discharge valve so as to be
opened and closed depending on the state-of-load measured by the state-of-load
measuring device.

15 5. A method for operating a fuel cell system which comprises: a fuel cell for generating power by being supplied with a fuel gas and an oxidizing gas; a fuel gas supply path for supplying a fuel gas to the fuel cell; a fuel off-gas circulation path for returning a fuel off-gas discharged from the fuel cell to the fuel gas supply path; an ejector, provided in the fuel gas supply path and driven by fluid flow energy, for
20 supplying the fuel off-gas in the fuel off-gas circulation path flow to the fuel gas supply path; a fuel pump, provided in the fuel off-gas circulation path or on the fuel gas supply path and downstream with respect to the ejector, and driven by a rotating machine, for pressurizing the fuel off-gas; a discharge valve for discharging the fuel off-gas from the fuel off-gas circulation path; and a control device operatively connected to the fuel pump
25 and to the discharge valve, the method comprising the steps of:

closing the discharge valve upon starting of the fuel cell; and
operating the fuel pump when the discharge valve is in a closed state.

6. A method for operating a fuel cell system according to claim 5,
5 wherein the fuel cell system further comprises a voltage measuring device for
measuring voltage of cells constituting the fuel cell, and
wherein the method further comprises the steps of:
opening the discharge valve when the voltage of the cells measured by the
voltage measuring device is lower than or equal to a predetermined value when a
10 predetermined time has passed since the fuel cell is started; and
closing the discharge valve when the voltage of the cells exceeds the
predetermined value after the discharge valve is opened.

7. A method for operating a fuel cell system according to claim 5,
15 wherein the fuel cell system further comprises a nitrogen concentration
measuring device for measuring concentration of nitrogen contained in the fuel off-gas,
and a voltage measuring device for measuring voltage of cells constituting the fuel cell,
and
wherein the method further comprises the steps of:
20 opening the discharge valve when the concentration of nitrogen measured by the
nitrogen concentration measuring device is greater than or equal to a predetermined value
when a predetermined time has passed since the fuel cell is started; and
closing the discharge valve when the voltage of the cells exceeds a
predetermined value after the discharge valve is opened.

8. A method for operating a fuel cell system according to claim 7, wherein the nitrogen concentration measuring device comprises a state-of-load measuring device for measuring a state-of-load of the fuel pump.